AVIATION

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Realistic war play—Smoke screen dropped around lower Manhattan by a plane from Mitchel Field

VOLUME XVI

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SPECIAL FEATURES

THE N.A.A. AND THE A.C.C.A.
A SPECIAL F.A.I. CALIBRATED ALTIMETER
THE PROBLEM OF SAFE LANDING FOR AIRPLANES
SOUTHERN CRUISE OF THE NAVAL SCOUTING AIR SQUADRONS

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AVIATION

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Admiral Coontz and the Air Arm

ADMIRAL R. E. COONTZ has not treated the work of aircraft at the winter fleet maneuvers with great enthusiasm although the Commander-in-Chief of the United States Fleet did acknowledge that "a modern fleet must have its aircraft fighters, at least, if nothing further can be developed His opinion of catapults is that they "do not seem to be working well, and aviators cannot be expected in peace time to sacrifice themselves so readily as the theory of scouting has led some to suppose. The actual distance land planes should go from succor is ten miles at present, else they may sink before help arrives after a forced landing in the water."

The commercial pilots of the world that are operating land planes over water routes will not be given a very high opinion of the Admiral commanding the American Navy when he states that he does not wish to risk the lives of Naval pilots more than ten miles off shore or from a mothership. We remember distinctly how Army and Navy pilots flew some 200 miles over the sea in the bombing experiments off the Virginia Capes, and how General Mitchell personally flew about 700 miles over water in a single day's test. And yet, a ten mile radius is now the limit Admiral Coontz assigns to the air operations of land machines.

He also has doubts as to the present ability of aircraft to operate from battleships "Until it has been demonstrated," he reports "that planes will operate at sea from battleships where they are now carried, it would seem premature to alter or rearrange any other types of combatant ships for their accommodation"

The heart of everyone who believes that aircraft can be made the first line of defense of the Navy will beat with a flutter when the real purport of these words is realized. Admiral Coontz's conclusions, that available funds be concentrated on a very few types of planes useful to the fleet and their equipment, "as the quantity and effectiveness of the air force actually available to the fleet did not appear favorable from a material point of view," is so nearsighted that the partisans of the air force cannot help but feel disheartened with the seemingly hopeless task of convincing ranking officers of the Navy that flying not only is a useful arm of the Fleet but also a menace when wielded by the enemy

The Theorist Becomes Practical

HERE is an illustration, as good as any that may be found, of the way in which practical ends are served by research along purely theoretical lines originally carried out with no ulterior purpose in view

The study of hydrodynamics used to be considered in the light of "pure science," and as being of little or no practical value. Its pursuit was simply a labor of love by men who apparently had no thought of its practical applications.

Yet, now it has come into its own. Society as a whole is to be abundantly rewarded for the labor of these few gifted and unselfish servants. The science of hydrodynamics is being depended upon more and more for practical aeronautical analysis and design In dealing with large streamline shapes such as airship hulls, it is found to be the only way in which many important problems can be satisfactorily solved Comparison of wind tunnel tests has shown that, even in model sizes, the agreement between theory and experiment is remarkably close A still closer application of this science to analysis of full scale conditions has also been appreciated by certain individual designers, aided particularly in this country by the mathematical work of Dr Max M Munk of the National Advisory Committee But the final link in the chain which binds together theory and practice into one consistent whole has not until now been apparent.

At the University of Michigan recently a handful of faculty members and students heard an address by Dr George de Bothezat on "The Physical Significance of the Reynolds Number" Here it was shown that the much-used (and abused) Reynolds Number is not so much a *means* of guaranteeing similarity of flow, but rather as defining the physical conditions which are a *result* of this similarity. Specifically, the Reynolds Number was shown to be the ratio between the normal and tangential force at any point in a region of disturbed air The real significance of this fact is at once apparent. A high Reynolds Number such as may be due to large size, high speed, or both, means that the tangential or frictional component is small in proportion to the normal forces. Hence the condition of a frictionless fluid, which is the basis of most hydrodynamical analysis, is more closely approached Thus the indications of practical tests are reinforced by proof from the science itself that the larger and faster the aircraft, the more accurately can its reactions be based on the assumption of a theoretical non-viscous fluid.

In the case of airships, at least, the scale is so large that hydrodynamical analysis in many cases seems to be more dependable than results derived from actual wind tunnel tests. In other words theory and practice meet and become one, as is always the case when each has a certain measure of completeness.

The Southern Naval Air Cruise

THE story of the Southern cruise of the Aircraft Squadrons, Scouting Fleet, which appears in this issue, strikingly illustrates the capabilities of our naval aircraft. If some of the higher naval officers do not seem to think much of the dependability of the aerial arm when compared to surface ships, they might be reminded that it took several centuries to bring warships to their present point of perfection Airplanes are only twenty years old, and war airplanes barely ten

The Southern Cruise of the Naval Air Squadrons

Headed by the Wright-Engined PN7, Scouting and Torpedo Plane Squadrons Fly 180,000 Miles

With a total of 180,000 mi. of flying to their credit in operations ranging from the mouth of Chesapeake Bay to the Virgin Islands in the West Indies, the Aircraft Squadrons of the Scouting Fleet, consisting of the scouting and torpedo plane squadrons, returned to the naval air station at Hampton Roads on May 1. The Squadrons flew into their home port headed by the PN7, flag plane of the air detachment, which has been operating with the Fleet on an experimental basis. Officers and men were tired, but enthusiastic over the work that had been accomplished during the winter maneuvers.

A Wonderful Record

In actual geographic distance the Naval air squadrons covered more than 5000 mi. in flying to the West Indies and return, and in the additional flying operations that were performed in connection with the war games and maneuvers centering around Culebra, P. R. Each plane flew an average of 130 hr. at an average speed of 60 mi./hr. Not a single fatality or serious accident to personnel occurred, and but one plane met with serious damage.

The planes which left Hampton Roads in January numbered twenty-five of the following types: twelve F5L's, two H16's and one PN7, all scouting and patrol types, and eleven DT torpedo and bombing planes. In addition five DT torpedo and bombing planes were based on Culebra with the Marine expeditionary force which was charged with the defense of the island in cooperation with the defending Fleet. Twenty-one planes returned to Hampton Roads, the others with one exception having been transferred to other stations and units.

The varied work of the air squadrons is attested by the duties which they were called upon by the Commander-in-Chief to perform. Scouting operations for the surface Fleet, spotting practice for battleship gunfire, torpedo plane attacks on surface craft, smoke screen laying, radio communication practice, mail service to the Fleet, observation of torpedo practice held by destroyer divisions in which the planes guarded against the loss of the torpedoes and assisted in their recovery, bombing and machine gun practice, photographic mapping, reconnaissance for aviation facilities in the Caribbean, all formed a part of the routine work that was carried out.

Log of the Cruise

The following is an account of the trip by air made by the Squadrons from Guantanamo Bay, Cuba, to Hampton Roads.

On April 21 eight F5L and five DT2 planes made the flight from Guantanamo Bay to Cienfuegos, Cuba, a distance of 380 mi. The torpedo planes stopped at Media Luna Cay for fuel. The remaining two scouting planes of the Squadrons were detailed to guard the flight of the DT2 planes to Media Luna. These two planes remained overnight with the U.S.S. Lark at Media Luna and proceeded to Cienfuegos on the 22nd with one division of DT2's. On the 22nd the eight F5L's and the five DT2's at Cienfuegos made the flight across Cuba to Mariel without mishap, followed on the next day by the remaining planes of the Squadrons.

While at Mariel four F5L's made flights with officers to Havana including a flight of the Commander, Aircraft Squadrons, to call officially upon the American Ambassador to Cuba, General Crowder. On the 24th the Commander entertained at luncheon on board the U.S.S. Wright in honor of the American Ambassador and his staff. General Crowder was unable to attend, owing to illness, but the officers of his staff were present, transportation being afforded them from and to Havana by the planes of the Squadrons.

On the 25th the PN7 and the torpedo planes made the flight to Key West, Scouting Plane Squadron One making the flight to Miami on the same day, with the exception of one plane, which lost a step in taking off at Mariel, and was transported to Miami on the U.S.S. Teal. On the 28th the U.S.S. Wright, the PN7 and the torpedo planes left Key West, the Wright for Charleston and the planes for Miami. The planes made the flight from Miami to Hampton Roads, via Charleston, arriving at Hampton Roads on May 1, the U.S.S. Wright following on the day after.

Splendid Performance of the PN7

Of especial interest to those who went on the Southern cruise was the splendid performance of the flying boat PN7. This was the flagplane of Vice Admiral Newton A. McCully, commander of the Scouting Fleet. The ship was piloted by Capt. W. R. Gherardi, commander of Aircraft Squadrons, Scouting Fleet, and Lieut. Lester D. Hundt. Others on the flying boat were Lieut. Comdr. Wadleigh Capehart, Lieut. A. P. Snody, Edward J. Mulligan, field engineer for the Wright Aeronautical Corp., a radio operator and five enlisted men.

The F5L's which are standard equipment for the fleet, are known in America and England as very excellent sea going flying boats as their hulls have been thoroughly tested out in many landings in rough water. When the Naval Aircraft Factory decided to design and build an improved machine for the same purpose they very wisely decided to retain the F5L hull almost without change. However, by using two Wright T engines and an entirely new wing structure, a very greatly increased performance was obtained. When first considering the PN7's it was contemplated to install two Liberty engines but when the calculations were completed on the possibilities of using two Wright "T" engines, the increase in performance and the added reliability which could be expected with these engines was so outstanding that it was decided to use them instead of Liberty's.

Advantages of New Power Plant

The wing structure in the PN7 is very clean and efficient, the wing span being some 20 ft. less than formerly, with only one pair of outboard struts. The "T" engines are enclosed in well streamlined nacelles and because of the compactness of these engines and low frontal area per horsepower the power plants offer very little resistance. The radiators for these "T" engines are just about the same size as contemplated for the Liberty's and the net weight of plane is only about 700 lb. more than if Liberty's had been used. The total horsepower available is 1100 as against 800 for the F5L.

The added horsepower together with the new wings has greatly increased the ease of take off. Almost all the time on the long cruise South and back the PN7 took off a load of almost 16,000 lb. The official trials gave a high speed of 113 m.p.h. which is excellent for such a large plane. The cruising speed is 78-80 knots and the PN7 readily holds its place in formation with many types of land ships.

That the "T" engines worked out well is shown by the fact that during the 165 hr. of flying the only replacement was a bushing in a cam follower, whereas the Liberty engines in the standard F5L's all had to be taken out for overhaul though most of the ships flew only 130 hr. during the cruise. The 15,000 mi. which the PN7 flew during the cruise is nearly two thirds the distance which the Round the World Fliers will have to cover. An interesting report on the engines reads in part as follows:

An Interesting Engine Report

"Our last two inspections of valve tappets showed no change in clearances and all oil leads clean. We have been changing oil about every twenty hours which helps considerably in keeping things clean. No oil or water leaks developed. Magnetos stood up in good shape. We are using an auxiliary booster for starting. This is quite a help if running magnetos do not pick up on first explosion. Method of starting found most effective with least chance of breaking starting dog... as follows: Magnetos fully retarded, throttle open to allow engine to turn up to 700-800 r.p.m., switch on, booster magneto turned by hand while turning over engine with hand crank. This continues a spark after hand crank has been disengaged. This is particularly necessary in cold weather. When carrying high officers quick starting is most important. During all the flying the water temperature did not rise above 150 deg. Fahr. without the shutters, oil temperature 150 deg.; oil pressure 68-72 lb. Average gasoline consumption 63 gal. per flying hour, oil consumption 2 quarts per hour."

Some Interesting Sidelights

A member of the staff of AVIATION visited the U.S.S. Wright, mothership to the aircraft scouting fleet, shortly after her return to Philadelphia and obtained some interesting sidelights on the trip. The PN7 made several reconnaissance flights besides its regular duties with the fleet. To quote Lieutenant Hundt:

The PN7 flying boat (two 550 hp. Wright T engines), flagplane of Vice Admiral N. A. McCully, commander of the Scouting Fleet (in front cockpit, left picture). Lieut. L. D. Hundt, one of the pilots can be seen leaning forward from the rear cockpit. On the right, Capt. W. R. Gherardi, Commander, Scouting Aircraft Squadrons, is seen reading a map

"We left Culebra and flew all the way down the Islands of St. Lucia, which was our first stop. This was a 5 hr. 25 min. non-stop flight. The beach was thronged with natives, some of whom were terrified at the approach of the plane and fled into the interior, others swam out to our anchorage while others came out in their canoes. This was on Feb. 29.

"On March 3, we took Lieut. Colonel Davidson-Houston, C.M.G., acting governor of the Windward Islands on an inspection flight around the Island of St. Lucia. He was so well pleased with this flight that we offered to take him on an inspection trip over his entire domain. Members of the flying boat's company desired to see the birthplace of Napoleon's Empress, the Empress Josephine, the Island of Martinique, and we flew there in 35 min. This is normally a trip of several hours by boat, as it is about 50 mi. We remained there over night and on the following day we flew over and encircled Mt. Pelée, the active volcano, which a couple of decades ago erupted and destroyed the town of St. Pierre. We got an excellent picture of the crater and I suppose came closer to it than anyone else ever has. This inspection of Mt. Pelée and the return trip to St. Lucia took us one hour.

Carrying a British Governor

"On the 10th, we started out with Commodore Gherardi in command with Lieut. Colonel Davidson-Houston on the inspection trip over his domain—the Windward Islands. Our first stop was made after 50 min. of flight at Kingston, St. Vincent, B.W.I., where huge crowds swarmed on the beach at our approach. The Governor received a salute of seventeen guns from the small British garrison. Here Lieut. Colonel Davidson-Houston subscribed to the oath of office as governor of the Isle of St. Vincent. I should have explained before that he is acting governor of the Windward Islands and it is customary to take an individual oath of office as governor of each of the islands and this trip enabled him to do this most effectively and with the least loss of time.

"We lunched at the home of the local administrator and at two o'clock in the afternoon left Kingston for St. George Island and Grenada, arriving there 1 hr. 5 min. later. It was in this section that Captain Kidd and other famous or infamous buccaneers of the Spanish Main used to have their rendezvous and it was very interesting to fly over the unbroken chain of Islands from St. Vincent to Grenada, known as the Grenadines, and see all of the rocky and mountainous bays and inlets where Captain Kidd and his gang used to hold forth. Grenada is a little more than 60 mi. from the coast of South America and only on a clear day the Island of Trinidad is faintly visible. At 4.30 we left on the return trip from Grenada to St. Lucia and in a little less than 2 hr. deposited the governor in his own house. This journey, which was made in a few hours, would have taken him several days on a government boat.

Joining the Fleet

"On March 14, we flew from St. Lucia to Culebra via St. Thomas, V. I., a distance of approximately 450 mi. in a 5 hr. non-stop flight. Here we joined the fleet in joint maneuvers.

"The flights of the PN7 were watched by many of the high officers of the fleet, who also observed the battle maneuvers from the plane and expressed themselves as delighted with its performance. Rear Admiral McCully, Commander of the Scouting Fleet, declared after several flights that the real place for a commander of a fleet was not on the bridge of a flag ship but in a plane such as the PN7.

"On the 14th we left Guantanamo on an expedition to map the Gulf of Batabano, which is a body of water separating Cuba from the Isle of Pines and which our government had contracted to chart, according to the old Platt Treaty. Our first stop after Guantanamo was Cienfuegos, Cuba, after 4 hr. 35 min. of flight. Leaving Cienfuegos we visited one of the loneliest Naval units outside of Guam, namely the field headquarters of a Naval surveying party at La Guna Cay. Here a party of very lonely Naval officers were delighted to see us come along and entertained us royally on the houseboat on which they live. We took on board the necessary supplies and equipment for mapping and mapped 400 mi. of coast line, including the Isle of Pines. On completing this mapping expedition we had to fly over the Island of Cuba to Mariel on the northern side. This trip was made in one hour and above the clouds while a tropical downpour was below us. We made a chart of Mariel and then started on our homeward journey."

Handling Seaplanes Afloat

The only damage that the PN7 received was when she was rammed by a motor dory and a few ribs were broken. When a formation of ten or twelve big flying boats return to their mother ship the question of getting the crews off rapidly is quite a serious one. If the water is at all rough or there is a tide, the planes have to be approached with extreme care and the crew of the last flying boat to be cared for have to wait for a long time.

The old controversy of the float plane against the flying boat is still being waged. Most of the pilots of the F5L's are keen for the boats, whereas others believe that all future planes should be able to be launched from catapults.

The Problems of Safe Landing for Airplanes

By W. LAURENCE LE PAGE

Massachusetts Institute of Technology

The development of commercial aviation makes the need for safety even more important than hitherto. It also demands airplanes of greater general utility. Safety in landing and the capability of landing in a confined area surrounded by obstacles, therefore becomes of considerable importance. The object of the present paper is to discuss the numerous methods of achieving these results, and give approximate ideas of their respective merits, at the same time setting forth their disadvantages. It is necessary for the speed in landing to be as low as possible, not only to curtail the length of the ensuing run along the ground but also to reduce the risk of damage on touching. Upon examination the whole problem is found to be one of considerable complexity. Obviously it is essential that in fitting any special braking device to a machine there should be the minimum reduction in load carrying capacity or loss of general performance.

Two courses are open to a pilot if he wishes to land his plane in an airdrome surrounded by buildings or trees. Either he may come in steeply and fast, touching the ground early and running far, or he may glide in at a small angle, touch late and run a short distance. In either case his landing will probably require the same space and he will be unable to effect any material reduction in landing distance. It is necessary, therefore, to look to mechanical means if any marked improvement in landing conditions is to be effected.

Aerodynamic Braking Devices

It is possible, within certain restricted limits, to improve the landing conditions of an airplane by attention to certain features in the aerodynamic design. The requirements are threefold. The drag coefficient must be large in order that the resistance shall pull the machine to a standstill rapidly. The lift coefficient must be large since the velocity is proportional to $\frac{1}{\sqrt{C_L}}$.* The energy of the machine which has to be dissipated in the run along the ground is proportional to the square of the landing speed, and therefore the landing speed must be kept low by means of a high value of C_L. This factor incorporates the speed at which the airplane stalls. Thirdly, the L/D must be small in order to obtain a large angle of glide.

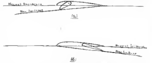
Now, except for the high lift, these requirements are detrimental to the general efficiency of the machine, and cannot be considered except in a compromise. It is obvious then that no very great steps towards the improvement of landing conditions can be obtained purely from aerodynamic design, without the aid of special braking devices.

There are two distinct classes into which all aerodynamic braking devices can be separated, namely those involving an increase in drag and those involving an increase in lift. Each of which conditions would result in decreased speed. The latter class may be subdivided into two divisions, in one of which the increased lift is obtained by increasing the wing area, and in the other the same result is arrived at by varying the section of the wing. This division includes slotted wings and wings with adjustable leading and trailing edges. It is proposed to deal with these separately.

Increase in Drag

The fitting of a flap along the upper surface of a wing in such a way as to be capable of being lowered flush with the surface is a possibility which instantly suggests itself as a partial solution to the problem in hand. But it will be found that no advantage can be gained from such an arrangement. Though the drag increases considerably and the L/D ratio drops off, these advantageous effects are put to no value by the accompanying decrease in maximum lift. The desirable steep gliding angle will be associated with a more rapid landing speed owing to the small lift coefficient and the ensuing run along the ground will be greater with the brake than without it. In every case with flaps of reasonable size the effects will be the same, and the landing speed increased as a result of the inferior maximum lift coefficient, while small flaps placed along the undersurfacing have been found to have very little effect at all. Even if it were possible to make use of the flap along the uppersurface of the wing to reduce the space required for landing, it would be found that the lateral control at the landing attitude would be considerably insufficient, and to obtain the necessary controlability the speed would have to be almost trebled.

Another system to be discussed in this class is that of closing in the undercarriage struts by means of fabric, stretched



Diagrams showing how wings fitted with adjustable flaps function in flight

normal to the line of flight path. In such a case it has been shown that considerable increase in drag can be obtained and the lift still remain unaffected. Experiments carried out in the wind tunnel on a model of a standard two-seater airplane with the space between the undercarriage struts covered in, have shown a decrease in the L/D ratio from 9 to 7 at an angle near the stall, the lift coefficient remaining the same. This indicates constant kinetic energy, but the airplane will touch 22 per cent sooner. Such an arrangement will undoubtedly set up a couple tending to stand the machine on its nose, but measurements of pitching moments have indicated 2 deg. or 3 deg. tail setting to be sufficient to trim.

Increase of Lift

As has been previously pointed out, a high value of C_L is indicative of a low stalling speed, and were it not for the restricted speed range, preventing the attainment of a high maximum speed, wings of high lift coefficient would be far more extensively employed. But the possibility of varying the area of a wing mechanically in flight, thereby altering the loading and the total lift, with a view to increasing the speed range and obtaining a low landing speed, involves complicated and weighty devices, which at best are very inefficient, both mechanically and aerodynamically. It must also be pointed out that no very great decrease in L/D ratio can be expected from such an arrangement, except that due to any change in aspect ratio, resulting from the increase in area.

It becomes necessary then to look to other methods of increasing the lift—methods which depend upon an increase in the lift coefficient rather than the actual lift. This can only be obtained by a change in the section of the wing. It will be necessary to change the wing section from a low lift high efficiency, to a high lift low efficiency wing.

Wings of the type shown in Fig. 1, *a* and *b*, have been tested and the results are interesting. Moving the leading edge down shows marked increases in lift coefficient at high angles. The L/D ratio is not decreased sufficiently for it is necessary to effect a very marked decrease, if the angle of

glide is to be steep. The result in full scale will be a low landing speed but the machine will travel a normal distance owing to the flat gliding angle. It will be useless for a pilot to increase this angle for the speed will go up as the lift decreases.

Similar experiments upon a wing with an adjustable trailing edge have shown very similar results with the flap down, but the drag is still not increased sufficiently to give the device any value in the landing problem. Experiments at the N.P.L. with an airfoil of R.A.F.9. section and adjustable trailing edge have shown for a flap angle of 6 deg., a lift coefficient of 0.0042 and the L/D of 3.3 has certain advantages. In all wings where the leading and trailing edges are moved the high lifts are obtained at angles of from 20 deg. to 30 deg. It must be pointed out that, if, as is sometimes the case in the wind tunnel experiments, the chord line from which the incidences are measured is that tangential to the leading and trailing edges of the wing, then this will mean an even greater angle of pitch for the complete machine. Such an attitude for an airplane in landing will mean a very high undercarriage to get the machine safely on to the ground. In the case of an adjustable trailing edge, it will be seen from Fig. 1 that the converse happens.

Slotted Airfoils

In this class of variable section wing may be placed the Handley Page type of slotted airfoil. Here is to be found a very effective means of obtaining, in flight, a high maximum lift coefficient from a normal high speed wing. With a normal R.A.F.15 airfoil the effect of a single slot is to put the maximum C_L up to 0.0040—an increase of 60 per cent. This will be equivalent to a decrease in landing speed of 15 per cent. The L/D at this lift is fairly low, which means that the slower landing speed will be associated with a fairly steep gliding angle. The kinetic energy will be decreased, and consequently the run along the ground.

Summarizing this, it appears that the machine will be able to come in steeply at a slow speed and run a short distance. It has been shown that, by the use of slotted ailerons, a fair degree of lateral control can be obtained under these conditions. The slot in the aileron should be opened as the flap is lowered, and closed as it is raised, thereby increasing the vertical force upon the wing tip to be lifted.

But even in this case there is still not a sufficient improvement in the landing conditions. One very great disadvantage in the types of airbrake so far discussed is the fact that they all depend for their effectiveness upon forces which vary as the square of the velocity, and therefore, they become less efficient as the speed of the machine decreases. The one method of applying a retarding force to an airplane in flight, which does not depend for its action upon the forward velocity of the machine, is that of the reversible pitch propeller.

Variable Pitch Propellers

Considerable full scale experimental work has been done on adjustable pitch mechanism for propellers by the U. S. Army Air Service and this, apparently, constitutes the only available data. Structurally and mechanically it has been proved possible to build a serviceable propeller, the blade angle of which can be adjusted in flight. Whirled on the test rig at McCook Field, a propeller designed for use with a 150 hp. Hispano Suiza engine on a small non-rigid airship, developed a negative thrust of 104 lb. at 1,500 r.p.m. with reversed certain to be irregular, but this should not appreciably affect could be obtained from such a propeller designed for use in an airplane and the machine brought to rest very rapidly. Experiments at McCook Field have shown a reduction in landing distance required to one third.

Just how the control of the machine would be affected is a point to be investigated. Since the propeller blades will be operating at large negative angles, the negative thrust is certain to be irregular, but this should not appreciably affect the steady flight of the airplane. The rudder control will be completely lost, however, and should the machine, when taxiing on the ground, tend to swing the tail round, the pilot will experience considerable difficulty in correcting this. With a twin screw machine this difficulty will, of course, disappear.

The performance of an airplane having a reversible pitch propeller will only be affected to the extent of the extra weight of the reversing mechanism, but it must not be forgotten that the pilot of a machine so fitted will be in a position to actually improve his cruising performance by adjusting his airscrew to the conditions of his flight. The device, as a brake loses its value completely, however, in the event of a forced landing due to engine failure, and this obviously constitutes its great and only disadvantage.

Mechanical Braking Devices

No mention has so far been made of such braking devices as come into use after touching the ground and depend for their action upon the friction of some part of the machine with the ground.

Friction brakes on the wheels and tail skid ploughs have been employed in a few machines, but not to any great extent. Numerous difficulties are attached to their use. The tail skid plough must have the great disadvantage of setting up very serious bending stresses in the fuselage, the magnitude of which, owing to the variability, cannot be accurately determined. In addition the damage caused to the airdrome surface is not a point in its favor.

Friction brakes fitted to the undercarriage wheels have considerable advantages. As the speed of the machine falls off, so the retarding force increases. Thus, also, the retarding force is closely connected with the angle of incidence, for it is proportional to the excess weight of the machine over the lift of the wings. As the incidence increases up to the critical, so the lift increases and consequently the apparent weight of the machine on the wheels decreases, which means less retarding force. Above the critical the converse happens—an increase in incidence indicates a decrease in lift and the retarding force is thereby improved.

However, extreme care must be exercised in the use of wheel brakes as considerable forces, tending to stand the machine on its nose, will be set up. It may be found necessary to fit extra wheels or skids, placed forward, to prevent this.

The question arises as to whether the wheels should be locked and allowed to skid or whether they should slip on first contact. If they are locked the pitching forces set up on first contact will be sudden and very great, and it seems that the wheels should always be allowed to just rotate during the complete landing. The fact that the machine tends to pitch forward when the wheels are gripped suggests the desirability of a compromise in the use of such brakes. As the wheels are gripped so it will be more difficult to keep the tail of the machine on the ground and consequently the retardation due to the drag of the skid and the resistance of the wings at large incidences will be lost.

It seems therefore, that the wheel brakes should only be applied to a limited extent to obtain the most efficient compromise.

Conclusions

The various methods of improving the conditions of landing which have been herein discussed may be divided into three classes. In the first two, the devices are purely aerodynamic in their action, and in the third they depend upon the friction on the ground. The first class involves the resistance of a flat surface to the forward motion of the airplane, and it must be remembered that such resistance varies as the square of the speed and that in consequence the devices lost their efficiency very rapidly as the speed of landing falls off. There is no appreciable change in the stalling speed and consequently the difficulties of bringing a machine, so fitted, into a field surrounded by buildings are not reduced, for though the speed is slow the gliding angle for that speed will not be very steep. Such devices, though they have the advantage of reducing the energy to be dissipated in the run along the ground, do not, however, give the pilot any greater scope for landing in small spaces bordered by high obstacles.

The variable-camber, variable-surface and Handley-Page wings have the great advantage of reducing the stalling speed of the airplane in flight by increasing the lift and lift coefficient, and a reduction in L/D ratio at maximum lift is generally apparent. Consequently, it becomes possible for a machine so fitted to land slowly and at a large gliding angle

*Lift coefficient (lb. per sq. ft. per mile per hour)

The steep angle of glide may necessitate greater strength of undercarriage, but this should not be prohibitive. The change in climbing performance of a machine with wings of this type should not be appreciably affected, with the exception of the change in loading due to the weight of the mechanism. It would seem that, since in all cases in this class the general performance of the machine is improved and in particular the limits of speed increased, the fitting of such wings to airplanes and the furtherment of experimental work along these lines should be encouraged.

Upon the possibilities of a reversible pitch airscrew it has been very definitely shown that, structurally and mechanically, such a device is quite successful. Its effect is regardless of the stage of the landing, and can be controlled at will by the pilot. On the other hand it has the great disadvantage, as previously mentioned, of becoming inoperative under conditions which make it most needed,—namely a forced landing due to engine failure.

Lastly, in connection with ground brakes, there is very little more to be said. Obviously the tail plough type is not to be recommended, but wheel brakes, if suitably adjusted, are fairly efficient during the short stage of landing in which they are in operation. Used in conjunction with other methods of retardation they are to be recommended, but great care must be exercised in preventing the machine from tipping forward.

A Special F.A.I. Altimeter

By F. B. NEWELL

When Lt. John A. Macready made his altitude flight on Sept. 28, 1921, his highest altitude was first reported as being 40,000 ft. and afterwards reduced to 34,510 ft. This reduction, it was stated, was due to calibration of the instruments, but it was really due to the use of two widely different altitude standards. The 40,000 ft. was computed by what is known as the isothermal altitude standard, while the 34,510 ft. was computed according to the standard of the Fédération Aeronautique Internationale (F A I). This difference of 4,490 ft. is not necessarily the fault of the altimeter, but of the standard to which the altimeter was calibrated.

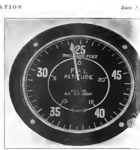
The isothermal altitude is that indicated by the ordinary service altimeter and is based upon the decrease in pressure with altitude, assuming that the mean temperature of the air column beneath the craft is 10 deg. Cent. This, however, is seldom the case. Therefore the service altimeter does not indicate directly the true altitude. It should never be used for high altitude measurements because it always gives an altitude which is greater than the true height if the mean temperature of the air column is less than 10 deg. Cent. If, however, the temperature correction is applied to the altimeter indication, the true height will be found.

This altimeter standard was used in the early days of aviation, but is far from being desirable for measuring the high altitudes reached by modern aircraft. An investigation is being made by the Instrument Branch at McCook Field to determine the best method of measuring altitude so that, in the future, the altimeters will indicate more closely the true height.

The F A I altitude standard is also based on the decrease of pressure with altitude, but is different from the present altimeter standard in that it is based on certain average observed pressures. The F A I altitudes are seldom the true heights, but always correspond to certain pressures, and therefore have been assumed to be a fair basis for the comparison of high altitude performances.

When a pilot is high above the earth, trying to exceed the world's altitude record, he does not care much what his actual altitude is, and far less what his altitude would be if the mean temperature of the air beneath him were 10 deg. Cent. What he does want to know is the altitude with which he will be credited by the F A I.

To give him this information a special F A I altimeter has been constructed and calibrated in the Instrument Branch and has been installed on his airplane. This altimeter differs from the service altimeter, not only in the standard to which it was calibrated, but in general appearance. Instead of



Special altimeter for F A I measurements, developed by the Air Service Engineering Division

the low altitudes being marked off on the outer circle as in the service altimeter, they are marked off on the inner circle with small figures. The reason for this is that they are of minor importance. The first revolution of the pointer is made in going from sea level to an F A I altitude of 25,000 ft. and the second in going from there to 50,000 ft. At present the part of the scale of most interest to Lieutenant Macready is between 30,000 and 40,000 ft. In adjusting the mechanism great care was taken to reduce to a minimum the errors throughout this range. This altimeter has no knob for shifting the dial to set the pointer at zero before the flight as is common on the service altimeters. This is not necessary because the F A I altitude is computed above sea level and not above the landing field.

The Burney Airship Scheme

Commander Burney's scheme for an imperial airship service connecting Great Britain, Egypt, India and Australia is still being pushed by its promoters. Consular reports to the Department of Commerce state that during the latter part of 1923, N. G. Atherstone, one of the promoters of the scheme, arrived in Melbourne from London, to ascertain whether the Australian Government would assist in the plan. He has explained that the British Government is prepared to contribute £400,000 as a first instalment toward the establishment of the service. Other instalments of £400,000 each are promised, but the maximum amount of assistance is set down at £2,000,000. Mr Atherstone has not asked the Australian Government for a subsidy, but it is expected to stand behind the project if it is successful.

It is the intention of the promoters of the scheme to inform the British Government what the various countries are prepared to do before making final arrangements for commencing the service. The proposed route of the airship service together with the times occupied between the various stopping-places, is:—Great Britain to Cairo, 2,161 mi., 40 hr.; Cairo to Bagdad, 645 mi., 19 hr.; Bagdad to Bombay, 1,771 mi., 41 hr.; Bombay to Calcutta, 885 mi., 23 hr.; Calcutta to Rangoon, 700 mi., 20 hr.; Rangoon to Singapore, 1,035 mi., 26 hr.; Singapore to Perth, 2,280 mi., 45 hr. It is pointed out that such an airship service would bring Australia within ten days of Great Britain, as against one month by the fastest steamship services now operating.

The N. A. A. and the A. C. C. A.

Exchange of Letters Shows that Closer Cooperation Between Two Bodies is Desirable

The two national aerial organizations, The National Aeronautic Association and the Aeronautical Chamber of Commerce are not pulling together as they should as is evidenced by the letters of Colonel Lahm, Chairman of the Contest Committee of the N.A.A. and Frank H. Russell, President of the A.C.C. Both letters indicate that the organized aircraft industry has not been recognized as such by the N.A.A. That these two organizations should be at cross purposes is most unfortunate at this time. Colonel Lahm wrote the A C C. as follows:

Colonel Lahm's Letter

"I shall not go into the broader subject of the relations between the Aeronautical Chamber of Commerce and the N.A.A.—that is a matter for Mr. Patterson and the Board of Governors.

"As far as the Contest Committee is concerned, it has always been my policy to cooperate to the fullest extent with the Aeronautical Chamber of Commerce. I have made a special effort in that direction personally and have impressed this idea on the minds of the rest of the committee. Frankly the cooperation has at times been entirely one-sided, and our efforts have not been reciprocated. For this reason, I am particularly glad to know that you, the President of the Chamber, feel we should have closer cooperation.

"We have endeavored to cooperate by furnishing the Aeronautical Chamber of Commerce with all information in our hands and to request assistance wherever it directly affected the aeronautical industry. We have supplied the Aeronautical Chamber of Commerce with advance information on all contests and the tentative regulations which have been drawn up for them and requested their criticism.

"The Contest Committee has, at present, three members who are directly connected with the aircraft industry. Furthermore the Contest Committee has requested that representatives of the Aeronautical Chamber of Commerce sit in on our discussions with reference to types of races desired and regulations covering them.

As for the sanctioning of meets and as for programs, these matters are not optional, but are dictated by Article 36 of the F.A.I. regulations, which states: 'The principal duties of the Contest Committees are as follows:

To enforce with supreme authority the present regulations.

To approve and enforce the national regulations promulgated by the National Federation.

"To provide for the management and control of all the sporting events that take place in their territory, as well as those carried out over an international course, of which their National Federation may have charge, and to take all measures to insure safety during the events. * * *

To examine the regulations and the programs of sporting contests and to approve same, with or without modification. * * *

'To impose and apply the penalties provided in the present regulations. * * *

'To [illegible] the sanctions.'

"As I have said above, we have invited the Aeronautical Chamber of Commerce to discuss these matters with us before finally taking action in accordance with the F A I regulations.

"In comparing the aeronautical situation here and abroad, one or two points are pertinent. Abroad, entries in the important contests are made by the industry itself. That is not the case here where, rather unfortunately I feel, we have to depend on the Army and Navy for our entries. This is a situation which I have always felt should be corrected and I have made some efforts to do so, without success so far.

There is one more point which should not be overlooked. We know the periodical agitation and investigations initiated by some of our friends (?) based on the supposed control of aeronautics in the United States by the aircraft industry. You will appreciate the delicacy of this situation and recognize the necessity, in the interest of aeronautics in general, for placing no weapons in the hands of the agitators who are doing no good and a great deal of harm. You can imagine as well as I do, the effect of this present investigation in Congress, if a limited association of aircraft manufacturers should be formed at this time, with the authority and privileges of the corresponding organization in England.

"The above are my views, briefly stated. I shall hope to see you in Washington soon and go into the matter more fully. In the meantime, you may count on the continued cooperation of the Contest Committee, your views and suggestions will always be given careful consideration and are always welcome."

Frank H. Russell's Reply

To the above letter Mr. Russell replied as follows:

"Your letter of May 2, in response to my letter of April 22, expressing certain views on the relation between the Aeronautical Chamber of Commerce and the National Aeronautic Association, is received and I thank you for it. I think the basis for all our apparent differences of opinion is found in the fact, as indicated in your letter, that the broader subject of the fundamental, basic relations between the two bodies, has not received sufficient attention from Mr. Patterson or the Board of Governors of the National Aeronautic Association.

"In reference to your statements regarding the policy of the Contest Committee. As President of the Chamber and a member of its Flying Meet and Show Committee, I have no knowledge of any efforts on the part of the Contest Committee to confer on matters relating to the flying meets, until after the Contest Committee have announced their program. If you have specific information to the contrary, I will be very appreciative if you will submit it. I do not consider a notice or request to persons connected with individual companies to attend meetings of the Contest Committee to consider technical rules to govern the races, as evidence of co-operation with our organization. To my mind, it is evidence of just the opposite.

"I presume, as you intimate in your letter, that failure to consider the industry before announcing the dates and places of our flying meet program for the year, has been due very largely to the fact that during the last two years, entrants in the more important races have been limited to Service machines and pilots. This condition, however, I think, should be considered purely incidental and I hope, transitory. At an earlier period and, I trust in the not distant future, conditions will be such that entries in the important races each year will be made by others more truly representative of the industry and commercial aviation. It would, therefore, seem important that we reestablish the principle that the industry, through its now established trade organization representing the designers, operators and manufacturers of aircraft, be consulted and brought into co-operation before the flying meets for each season are determined. By thus securing close co-operation with the industry, from the initial stages through to the completion of all meets, each year, the primary and vital interests of the industry in these events, may be properly safeguarded.

"Your letter suggests that there may be some failure on the part of myself or others in the industry to recognize the desirability and necessity of having racing meets sanctioned by the National Aeronautic Association. This is not the fact. I believe everyone subscribes to this principle. What is deplored, however, is the fact that there does not appear to be an equal understanding regarding the necessity and desirability of also having meets sanctioned by the industry. It is not necessary that the latter sanction be emphasized with the public, but since, in the final analysis, the interest of the industry in flying meets is greater than that of any other single

group, we must urge that in determining the flying meet program of each year, the needs and wishes of the industry must be considered, with a view to determining general policies and objectives and making provision for the proper interpretation of these meets before, during and after the event.

"When it comes to flying the races and their technical control for the purpose of determining relative performance, that should be the exclusive field of the Contest Committee. Just as certainly as other questions, on account of their nature, are of such a vital interest to the Services and the Government as to impose upon us the obligation of recognizing and accepting, on these points, their views as practically controlling.

"Referring again to your letter and the statement that the Contest Committee includes three members directly connected with the aircraft industry, and to requests that representatives of the Chamber sit in your conferences with reference to types and regulations. It is wholly impracticable for any accredited representative of the Chamber to participate in formal consideration of questions of detail in advance of consideration, approval and sanction of a definite event or program. You will pardon my recurrence to this subject, but inasmuch as it recurs in your letter to me, it seems desirable that I re-emphasize this particular point.

"Your reference to periodical agitation and investigation of aircraft matters leads me to state that, in my opinion, the proper way to defend ourselves against these attacks is by taking a militant attitude and assuming the initiative. I appreciate that the reluctance of the N.A.A. to establish proper relations with the Chamber in this and other matters, has probably been due, in a measure, to timidity, excessive caution or prejudice toward the industry in the minds of some of the men identified with the management of the N.A.A. Is it not possible that this timidity, caution or prejudice is also the direct cause of the delay and disappointment that we have met in realizing our hopes as to the satisfactory growth, development and usefulness of the N.A.A.? As is well known, there has been an organized effort to demoralize and prevent the development of aviation in the United States. The failure of the N.A.A. to take up the cudgels vigorously and help fight to destroy this group, has permitted the insidious activities of that contemptible and very active group of individuals to continue their work of destruction. As a result, we are faced at the moment with an effort by these individuals to mislead disappointed pilots, etc. throughout the country for the purpose of directly opposing and thwarting the N.A.A. ... we consider ourselves honest, intelligent men having an understanding and a deep responsibility in connection with this important subject, I feel that instead of compromising with these forces of evil, we should fight and destroy them. I think we can better afford to stand criticism on account of effectively meeting and handling these difficulties, than to stand being criticized for the other thing. If we fail to recognize our problem and effectively meet it, I think we will be subject to criticism not only by this group but very properly, by people more representative of character, responsibility and national welfare. I believe that altogether too much thought has been given to the "delicacy" of this situation. I do not see the danger that you apparently do, in giving sympathetic recognition to the responsible units in the aircraft industry, either considered individually or collectively. I will go further and state that unless the present disinclination, in certain quarters, to give decent recognition to these interests is changed, our aviation in a national sense will soon reach the vanishing point. If our thought and action is not based upon the principle that without a healthy, active, prosperous industry, aviation in a national sense does not exist, we may, in my opinion, just as well abandon the idea of 'America First in the Air' and turn the field over to the British, Dutch, German and French manufacturers. They have been actively and persistently after the market in this country for the past seven years and if the Congress, the public and the Air Services of our country are prepared to capitulate, I think what is left of the American industry can stand it, if the country can."

British World Flight

After having given his Vulture a thorough overhaul, Maj. Stuart Maclaren pushed off from Calcutta, India, on May 21, and reached Akyab, Burma, the same day. The Vulture is now nearing the end of the second division of the British round-the-world route.

The second division of the British World Flight extends from Karachi to Tokyo, Japan, via Nasirabad, Allahabad, Calcutta (India), Rangoon (Burma), Bangkok (Siam), across French Indochina, Hongkong, Foochow, Shanghai and along the southern coast of Japan to Tokyo, a total distance of about 5,880 mi. In Tokyo a spare engine is provided for, and the Vulture will receive a general overhaul for the difficult passage to the American continent by way of the Kuril and Aleutian Islands, which our own World Fliers have just negotiated.

The Asia to America flight will form the third division of Maclaren's voyage, which here will follow a slightly different route from that laid out for Major Martin's squadron. Starting from Tokyo, the Vulture will stop at Minato (also called Minato-gaura and O-Minato) on the Northeast coast of Honshu, then at Bittoho, on the Island of Yelorofu, and on Paramushiru in the Kuriles. The British route here deviates from the American route in that the latter includes the hazardous 860 mi. flight over the sea to Chicagoff, on Attu or Near Island, whereas the British airmen will cut up this long hop into three sections by stopping at Petropavlovsk, Kamchatka, and at Nikolski or Behring Island, in the Komandorski Group. By using these two stops, which are situated in Russian territory, which Major Martin's flight avoids, the over-the-sea hops out of sight of land will be cut down to stages of approximately 300 mi. each.

From Chicagoff the Vulture will follow the American route in the opposite direction to Dutch Harbor and to Chignik, and then deviate from it by stopping at Cordova, Yakutat, Fort Wrangell, Bella Bella and Vancouver, B. C.

Regarding the engine trouble which kept Maclaren on the ground several weeks, first in Greece and then in India, *Flight* writes as follows:

"It is a most extraordinary piece of bad luck that the engine should twice have failed owing to much the same trouble, especially as, to the best of our knowledge, no such failure has ever been known to occur. Napier "Lion" engines have been used extensively on the air liners, and it might have been expected that if there were a weak spot in the reduction gear design it would have come to light during the hundreds of thousands of miles flown by machines fitted with these engines.

"The theory has been advanced that possibly the engine mounting may have been at fault, and that resonance may be at the back of the problem. There is on record the case of an airplane of a certain type in which one particular wire in the wing bracing continued to break. The wire was replaced by a heavier one, but this also broke. An "outsize" wire was then fitted, but this also failed. The question of resonance was then gone into, and the apparent mystery seemed likely to be solved. A small structural change was made and it was found that the original size of wire was then equal to the work."

Paris to Tokyo Flight

Capt. Pelletier d'Oisy and Sergeant Vesin on May 20 reached Shanghai, China, from Canton, covering the 870 mi. in 9 hr. 20 min. Unfortunately, in landing on a golf course which had been chosen as the landing place, the plane ran into a bunker and smashed the tail, without injuring its occupants, however. The machine was apparently a total washout.

Captain d'Oisy first announced that he had decided to abandon his flight to Japan. However, when General Ho-Feng-lung, military governor of Shanghai, offered him a Chinese airplane and the French pilot had made a test flight in it he declared that he would continue his flight in the new ship.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

The First Light Flying Boat

The first marine counterpart of the light plane—a "light flying boat"—is now under construction in the factory of Short Bros., the English aircraft manufacturers of Rochester. This little ship is of unusual interest not only because it will be the first of its type built anywhere, but also because it is entirely built of duralumin, except for the wing covering, and because it is a twin-engined monoplane.

The construction of the hull follows the principles of the Short "Silverstreak" tractor biplane, which was produced in 1920 and was described at the time in AVIATION. The framing of the hull consists of duralumin formers or rings of L section to which the duralumin plating is riveted. Longitudinal stringers stiffen the plating between the rings, but do not run through the length of the hull. Where the wing spar and strut fittings occur, rings of heavier construction are used and built-up formers are added to the rings where the hull expands into the two steps. The latter are separate structures and are open at the rear so that the water can run out when the ship is in the air. The space inside the hull is entirely unobstructed, as the former only projects a couple of meters inward from the skin, and there are no other internal bracing members.

The monoplane wing is built of two corrugated sheet duralumin spars and ribs of channel section in which lightening holes are cut, with fabric covering. The wing is built in two panels which are the top of the hull and are braced by struts, as shown in the accompanying outline drawings. The ailerons run all the length of the wing and are operated by cranks on the inner ends of the aileron tubes from rods running vertically down into the hull. The wing is of RAF15 section. The wing tip floats do not require special comment, nor do the tail surfaces, except that the latter have tubular spars and channel section ribs, and are also fabric covered.

The power plant consists of two 700 cu. cm. (42.7 cu. in.) Blackburne "Tom-Tit" engines, each mounted separately in a streamlined cowling well aft on the wing, and each driving a tractor propeller through an extension shaft at engine speed. The engines are started from the cockpit, which is ahead of the wings, by means of individual kick starters of the type used on motorcycles.

To facilitate handling ashore, a pair of large diameter wheels are supplied with the machine. These are carried on an axle which can be pushed into a tube running across the hull in line with and slightly above the main step. For flying the wheels are unshipped and left behind, or may be carried inside the hull.

Following are the main specifications of the machine:

SPECIFICATIONS OF THE SHORT LIGHT FLYING BOAT

Span of wing 38 ft	Height of rudder 2 ft 7¼ in
Chord of wing 5 ft	Wing area 196 sq ft
Overall length 24 ft 6¾ in	Aileron area 47 sq ft
Distance from nose to leading edge 9 ft 8 in	Stabilizer area 22.5 sq ft
Distance from trailing edge to stabilizer 7 ft 6 in	Elevator area 15 sq ft
Chord of stabilizer 2 ft 3 in	Fin area 1 sq ft
Chord of elevator 1 ft 8 in	Rudder area 5 sq ft
Span of rudder 10 ft	Total horsepower 40 (approx)
	Gross weight 850 lb (est)
	Max. speed 68 mi/hr (est)

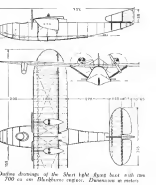
The Most Desired Light Plane

Some months ago, when the light plane was just beginning its long road to popular acceptance in this country, the Huff Daland Co. sent out a questionnaire to several thousand pilots and others interested in flying. The object was clearly stated in an introduction.

"It is our hope to incorporate all of the best characteristics in the design selected, bearing in mind however that many of the features listed will necessarily conflict, and that the most satisfactory compromise from your own personal viewpoint is desired.

"The tentative layout is based upon available motors, ranging from 12 to 27 hp., and weighing from 50 to 75 lb. complete. The useful load to consist of one man and miscellaneous equipment totaling 185 lb. It is estimated that between these limits a speed range of from 30 to 70 mi./hr. can be obtained, with a climb at sea level of 650 ft./min. at 42 mi./hr., giving a climbing angle of from 8 to 10 deg.

"State whether a two passenger plane instead of a single seater, seems essential for the purpose desired, and if so, what motor is available that will give satisfactory performance and fall within the price limits selected."



Outline drawings of the Short light flying boat with two 700 cu. cm. Blackburne engines. Dimensions in meters

An Interesting Questionnaire

The questionnaire asked in particular information on the following points:

"1. General arrangement: biplane, monoplane, tractor, pusher, etc.
2. Type of wing curve: thick, semi thick, thin, etc.
3. Type of wing bracing: all strut, strut and wire, or cantilever, etc.
4. Folding wings: are they essential, convenient or unnecessary?
5. Fuselage Construction: wooden stick and wire, wood longerons and veneer monocoque, or welded steel tubing?

6 Type of Landing Gear ordinary wheels and axle, tripod without axle similar to "Petrel," or combination wheels and skids, etc ?
7 Speed Range desired
8. Relative importance of high and low speeds
9 Relative importance of performance versus fuel economy in flight
19 Endurance desired At what air speed ?
11 How high a wind must it be safe to fly in ?
12 Maximum overall dimensions allowable.
13 Total wing area desired
14 Gross weight of machine loaded for flight
15 Wing loading desired
16 Power loading desired
17 Horsepower selected Give name of motor if known
18 Maximum price plane could be sold at to meet with popular favor
19 In your opinion what would be the best form of competition to be held at the Races next fall, to determine the most suitable type of light plane for use in this country, high speed race, lowest landing speed, etc, or a contest based on points for all around performance ? How should these points be distributed ?"

What the Replies Indicate

From some 400 replies that have been received a table was prepared weighting the performance characteristics most desired by the pilots who replied This list is a most curious one The there items given below are significant

Low speed	.38	per cent
Climb	. 7	" "
High speed	.14	" "

The remarkably high value given to low speed shows a new desire awakening in the flying public, the desire for a runabout or taxiplane that will not crash every time it has a forced landing, a machine that does not necessarily have a high speed of 100 mi./hr This demand for a low landing speed will make many designers think again after they have considered 40 mi./hr good enough for landing It points the way also to a new evaluation to be put on low landing speed by the officials of a light plane competition

A slow speed "race" was suggested in which the machines were to be lined up on the starting line, start at a signal, be in the air at a 200 yd line, and then fly as slowly as possible within a foot or two of the ground so that a drop would not hurt them The last man over the line at the end would win There are undoubtedly many difficulties in the way of such a "race" Perhaps it is too dangerous to try, especially with experimental machines. It may be that an alternative method of theoretically arriving at the landing speed by means of the maximum lift coefficients of the airfoils used would be a fairer comparative test Undoubtedly piloting skill would spell a large part of the success of the winner One recalls the Farman Sport low speed test when the little two seater was credited with a landing speed of 14 85 mi./hr ! Fictitious values such as these would be obtained by expert pilots flying in peculiar ways

Measuring Minimum Speed

As to actual accuracy, however, one doubts if the formula will give any closer results. After all the considerations of which surfaces are allowed in calculating area, and the load required in determining weight, are settled, there still remain the great discrepancies in the lift coefficient values. Different speeds at which tests were run in determining these values require correction to a standard, and corrections for interference make the matter hopelessly complicated for flying field use After it is all done, experts disagree about even such fundamental considerations as whether the choice of wing for full flight work makes any difference at all While the differences in three thick airfoils may be great in model sizes, it is doubtful if they would be measurable in full scale. Unfortunately full flight research is still incomplete on such tests. Some work now being conducted by the National Advisory Committee for Aeronautics may set our minds at rest on some of these points within the year

The only accurate way of measuring minimum speed would be by the use of an accelerometer If a machine is flown with an accelerometer on board, at or near the stalling speed, and the stick is given a quick pull-up, the air speed at the instant of pull-up divided by the square root of the accelerations in terms of gravity will give very accurately the exact minimum flying speed This is owing to the fact that the acceleration would be zero at the stalling speed and would increase as the square of the speed above that.

It is doubtful if it would be required to obtain this value so accurately, except perhaps in determining the landing speed of the Pulitzer racers. For light planes what the pilots want is a safe landing skip It might easily be, however, that of two machines at opposite ends of the landing speed range, the faster could get into much smaller fields. Barbot's Dewoitine had a very low landing speed, but he was unable to get it down at all in small fields, it was too efficient A much smaller wing would have dropped into fields with half the run necessitated by the Dewoitine If we could have not a slow speed race, but a quick stopping race from a 10 or 20 ft. barrier, we would have a better means of judging the safety of machines in forced landings

Importance of Climb

The second remarkable fact about the answers of the prospective purchasers of light planes was in regard to climb. One would have thought that, seeing the importance of low speed, they would also see the even greater importance of climb But as only 7 per cent did so, it seems that climb is not thought of at all as being vital to safety Yet, just as low speed helps in getting into emergency fields, quick climb helps in getting out of them One is even more helpless climbing out than settling in, for there are many simple tricks like sideslipping, fish tailing, ground looping, etc which allow one to drop into tight places But there are no such tricks for fooling the engine. No zoom will ever give an actual 150 per cent performance If the plane will climb 300 ft./min. with the engine wide open, it cannot be made to clear a 100 ft line of trees in 15 sec., or 1/4 min (no wind) One wonders what would have been the fate of this factor of climb if put up to the English light plane pilots, who from reports did not have any too much climb at Lympne There is, I believe, little question but that climb would have been placed at the head of the list

It is for this reason that the light plane event of the Dayton races is such a good test of the excellence of the light plane performance A climb of 500 ft is required in each lap of the 5 mi. course The prizes ($3,200) are being put up by the Dayton *Daily News* which offers also a Trophy to the winner All machines are required to climb during the second leg of each lap to the height of a 500 ft balloon This leg is 2 mi long Five hundred feet in 2 mi. may not seem much to the DH4 pilot, but the designers whose machines have to circle for altitude on each lap of the course will wish they had designed for twice the climb This race was well planned to show all around performance

A DH53 at Dayton Meet

It is reported that some sportsman out at Dayton has purchased a light plane from England. The rumor has it that the machine selected was one of the DeHaviland 53s, the little machine which made a successful flight from London to Brussels last winter. It seems certain now that there will be at least two foreign entries in the light plane races.

The DH53 incidentally seems to strike the fancy of a good many amateur fliers and owner pilots An interior view of the DeHavilland plant, recently published in *Flight*, shows at least a dozen light planes of this type in various stages of assembly. It has been announced that the Australian government has ordered two DH53's for experimental training purposes.

U. of D. not Building Light Plane

C H Powell, of the Department of Aeronautical Engineering, University of Detroit, advises that contrary to what was said in the May 5 issue of AVIATION, the University is not building any light plane, nor has any been entered in the Dayton races.

American World Flight

The three American world flight planes, piloted by Lieutenants Smith, Wade and Nelson, reached Kasumigaura, the Japanese naval air base 30 mi. from Tokyo, on May 22, after having made the flight from Yetorofu Island, in the Kurile Group in one day The distance of 720 mi. was covered in 12 hr 30 min flying time

The day following their arrival at Yetorofu (May 19), the pilots attempted to continue their flight, but after having taken off they returned to their base on account of thick weather. On May 22, the weather having cleared, the Chicago, Boston and New Orleans hopped off at 3 a. m. Five hours later they circled the American destroyer Ford, which was anchored at Kushiro, but as everything was O.K. they did not come down but continued to Minato, which was reached at 10 a m Here the ships were gassed and the crews had lunch At 12 39 they took off again and flew to Kasumigaura where they landed at 5 40 p m Both the planes and their crews were reported to be in excellent shape The airmen have now covered from Santa Monica 6575 mi. in 90 hr flying time, or at an average speed of 73 mi./hr

The three planes will be thoroughly overhauled at Kasumigaura which is a main supply station on the world encircling route of the American expedition and where a stay of one week is allowed for. The fliers are now exactly one month behind schedule, and this may prove a serious handicap for they will enter the typhoon region of the China Sea at its worst period, and run into torrential rains in India

The American World Flight is being followed with great interest in Japan. Our fliers have been received with marked cordiality, the school children of Minato greeting them with "America" and "Columbia, Gem of Ocean," while at Sendai a squadron of Japanese airplanes met them and escorted them to Kasumigaura Lieutenant Smith mentions in one of his dispatches that the two destroyers of the Japanese Navy have extended every conceivable courtesy. Major Blair, aerological officer who has been following the flight on board the destroyer Ford, has done invaluable work in forecasting the weather

Unofficial news from Washington has it that Major Martin either will, or will not, rejoin the fliers abroad The last official dictum was that he would

Navy to Try for World's Records

The Navy plans an endurance and speed test of the Navy CS2 long distance scouting, bombing and torpedo plane recently developed for use with the Fleet. The test is expected to continue throughout twenty-four hours in an effort to establish new world's records for duration, distance and sustained speed over long distance

The test will be conducted from the Naval Air Station, Anacostia, D C, over a measured course of 50 km over the Potomac and non-stop flight of between 24 and 30 hr is anticipated

The CS2 plane is a twin pontoon seaplane powered with a Wright T3 engine with rated horsepower of 585 The plane is designed to carry a useful load of more than 5,000 lb. including a crew of three men

Lieuts. F. W. Wead and John D Price, U S Navy, are the pilots of the plane on its flight They will alternate at the controls throughout the day and night. The plane has been fitted to permit one of the officers to sleep while off duty and food is carried in the plane for use during the flight The provisions consist of hot coffee, sandwiches and cold chicken

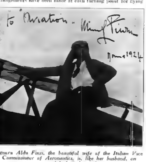
The flight will be made over a course extending from Haines Point on the Potomac river to a buoy south of Marshall Hall with an elbow at Fort Hunt and return to the Haines Point starting buoy Observers will be stationed at the there above mentioned points and timers are located at the extreme end of Haines Point

It is hoped that the following world's records for seaplanes will be broken Duration, 11 hr 7 min, Speed over 500 km, 116 km/hr, Speed over 1000 km, 114 km/hr and that the following records for speed over the distances will be established 1500, 2000, 2500, 3000 and 3500 km

The Naval officers who are piloting the plane estimate a performance of 30 hr non stop flight at an average speed of 80 knots or 90 mi /hr This would be a distance of 2700 mi which on the map would represent the air line distances between the following points: Washington, D. C., to Southern Greenland, New York to the Azores, Washington to Northern Brazil, and Washington to San Francisco

The pilots will change seats in the air and will take watches at the controls for about four hours each Suitable lighting arrangements have been made at each turning point for flying throughout the night. The plane is equipped with running lights and lights to illuminate the instrument board for night flying

The endurance test is designed to bring out to the limit the qualities of this new service type of Naval plane It is desired to prove the capabilities of modern aircraft designed for Naval service and carrying heavy loads for long distances in operations with the Fleet Such planes must of necessity suffer the handicap of the added weight necessary for pontoons to enable the craft to alight and take off on the surface of the water Owing to the maximum load of gasoline that will be carried on taking off, two flying boats will taxi in front of the CS plane and give it the advantage of the slipstream from their propellers in aiding the long distance plane to get off the water



Signora Aldo Finzi, the beautiful wife of the Italian Vice Commissioner of Aeronautics, is, like her husband, an accomplished airplane pilot

Giving the Good Example

AVIATION is indebted to Gen Alessandro Guidoni, chief of the aeronautical engineering corps of the Italian air force, for the fine photograph of Mrs Mimy Finzi, Italy's newest aviatrix, which appears on this page As the wife of Deputy Aldo Finzi, vice commissioner of aeronautics and minister of the interior in the Italian cabinet, Mrs Finzi insisted on obtaining her pilot's certificate, and this she has now brilliantly accomplished

Deputy Finzi is by the way one of Italy's foremost war fliers He was one of the pilots of the Serenissima squadron of seven S.V.A planes which in 1917 made a peaceful "Bombing raid" on Vienna, showering the Austrian capital with propaganda leaflets proclaiming the justice of the Allied cause Everyone of these planes returned from the 400 mi raid which was commanded by Gabriele d'Annunzio

AIRPORTS AND AIRWAYS

Loening DH Mail Plane Tested

Successful tests were completed last week by the Air Mail Service with the first DH mail plane fitted with wings built by the Loening Aeronautical Engineering Corp of New York. These wings, which were ordered some three months ago, have a special wing section, the Loening No. 10, which was specially developed for this plane. Elaborate wind tunnel tests were made with this section at the Massachusetts Institute of Technology under the direction of Prof. E P. Warner, and a careful study was made of the ailerons system on the wings to increase lateral control at stalling speeds. The wings have metal ribs made of 17S aluminum alloy and wooden spars, the latter members being the only non-metal elements in the wing. The covering is of fabric.

The interplane truss consists of two N type struts on each side of the fuselage. These struts are made of welded steel tubing and are of streamlined shape.

The Loening DH mail plane was delivered early in April for test at Garden City, where under the direction of J. E. Whitbeck, superintendent of the Eastern Division of the Air Mail, preliminary performance tests were made by a board of Air Mail pilots consisting of C Eugene Johnson, Dean C Smith and Wesley L. Smith.

The results of these tests showed that, using the Eagle propeller, the landing speed of the Loening DH is 45 mi/hr or about 15 mi slower than that of the standard Mail DH, while the maximum speed is 131 mi/hr, or about 10 mi faster than the regular DH. This increase in the speed range was accompanied by the desired increase in lateral control while carrying a mail load of 500 lb. Fitted with a "club" propeller and carrying full mail load, it is estimated that the Loening DH will land 5 mi slower and cruise 5 mi faster than the regular Mail DH.

Test trips have since been made over the transcontinental airway, new records for speed being established on practically every run. On one occasion Mail Pilot Jack Knight made with this ship a round trip from Omaha to Cheyenne and return, both runs being flown at an average of over 130 mi/hr.

At a Conference held last week in Chicago, with Second Assistant Post Master General Henderson and the Superintendents of the Air Mail Service, the adoption of these wings was decided on, and orders were given to the Loening Company to prepare the first ten sets of wings for delivery in July, others to follow thereafter for replacement through the year.

Aeromarine Mail Plane Delivered

The Model AM1 Mail Plane left Mineola at 7.50 a m May 13 bound for Chicago in charge of Pilot Ward of the Mail Service. This ship, as will be remembered, was designed and constructed especially for night flying service by the Aeromarine Plane & Motor Co of Keyport, N J. It has a landing speed of under 45 mi/hr and a pay load of more than 1,000 lb. Further experiments with this ship will be conducted at Chicago and Omaha.

The ship is of similar construction to the Aeromarine metal hull flying boat, the fuselage and tail surfaces being constructed of 17S alloy. The fuselage is of plate girder construction, the tail units are covered with fabric, the wings have a wooden framework cloth covered. It has the identical fuselage and tail unit as the AM1 which was flown to Rock Springs, Wyo., and return and during this test was piloted by some twenty different Air Mail pilots. The original wings of this ship are now on the AM2 which is now at Hazelhurst Field undergoing preliminary tests.

The difference between the AM2 and the AM3 is that the former has a radiator under the fuselage and the tanks in the upper wings, while the latter has a nose radiator and tanks in the fuselage. The horizontal stabilizer of the AM2 is somewhat larger than that of the AM3 and is of the lifting type, while the AM3 stabilizer is of symmetrical section type.

Entries for Beaumont Cup Race

Following is the complete list of entries for the Commodore Beaumont Cup race which will be held June 22, at Istres, France (near Marseille)

1. Salmson-Bechereau plane, 500 hp. Salmson radial engine. Entered by the Salmson Motor Co (France).
2. Nieuport Delage plane, 450 hp. Hispano-Suiza engine. Entered by the Nieuport-Astra Co (France).
3. Nieuport-Delage plane, 300 hp Hispano-Suiza engine. Entered by the Nieuport-Astra Co (France).
4. Ferbois plane, 450 hp Lorraine-Dietrich engine. Entered by the Societe Industrielle des Metaux et du Bois "Ferbois." (France)
5. Gloster plane, 600 hp. Napier Lion engine. Entered by the Gloucestershire Aircraft Co, Ltd. (England)

As to what these racers will be, little information is at hand. The Salmson and the Ferbois are both monoplanes, while the two Nieuport-Delage machines are sesquiplanes (1½ planes), and the Gloster is a biplane.

It is further known that the Ferbois is entirely built of wood, including the wing covering, while the fuselage is of semi monocoque construction. The span is 34 ft 4 in, the overall length 22 ft 8 in, the wing area 167 sq. ft. and the gross weight 2300 lb. The landing gear is of the retractable type, the driving mechanism of which is actuated by the engine. The designed speed of this ship is 230 mi/hr at 2000 r.p.m.

The Ferbois Co. proposes to use this ship to attempt to beat the world's maximum speed record, now held for the United States by Lieut. Al Williams, U.S.N., with 266.6 mi/hr. A set of racing wings, 28 ft 8 in in span and having a total area of 130 sq. ft. has been built for this purpose, and it is proposed to boost the compression of the Lorraine engine.

Akron News

By Hugh Allen

Honoring Pilot Ward T Van Orman, his aide, Carl K. Wollam, who in the Goodyear III won the National Free Balloon contest which started at San Antonio, Tex., April 24, and Maj. Norman W. Peck, Army pilot, whose balloon finished third in the same race, a dinner was held at the Akron, Ohio University Club, Thursday, May 1, and the three fliers presented trophy cups by a representative of the Akron Chamber of Commerce. The reception for the winning flyers was sponsored by the Akron chapter of the National Aeronautic Association and civic organizations of Akron, to publicly congratulate the three men on their success in the elimination race. Over 200 people attended.

Van Orman, Peck and Wollam sailed on May 27 for Europe with Capt. H E Honeywell, whose entry took second place in the April meet. They will represent the United States in the International Balloon classic from Brussels, June 10.

At the Akron dinner the three successful contestants gave graphic and detailed accounts of their flights and promised to do their best to repeat the performances of the American contest in the coming International meet abroad.

Other speakers at the meeting for the airmen included John Gammeter, of The B F Goodrich Co, C. W. Seiberling of The Seiberling Rubber Co., Hugh Allen, of The Goodyear Tire & Rubber Co., John S Knight, managing editor of the Akron Beacon Journal, Mayor D. C. Rybolt, of Akron, Dean Frank M. Comstock, of Case School of Applied Science, where Van Orman was graduated, and Charles Herbrich, president of the Akron Chamber of Commerce.

Detroit Aviation Society Meets

"Make America first in the air!" This was the task set for the business brains of the nation by Edwin Denby, former Secretary of the Navy; Admiral W. F Fullam, retired, Paul Henderson, Second Assistant Postmaster General, and Ernest A Lehmann, Zeppelin expert, in the annual meeting of the Detroit Aviation Society recently held in the Detroit Athletic Club Building.

These authorities indicated that in spite of the progress made by the Army, Navy, Post Office Department and a few private interests in behalf of air transportation development, the aircraft industry, as an industry, is being starved to death in this country and that its only salvation, in view of the apparently uninterested attitude of the American public at large, rests with private business interests in the creation of a great commercial air fleet.

America's progress in the air was portrayed by means of motion pictures of the Air Mail Service, recent developments in Army and Navy airplanes and airships. Among those at the speakers' table and in the audience were Leonard Kennedy, of the Curtiss Aircraft Corp., P. W. Litchfield, vice president of the Goodyear Zeppelin Corp., Maj. Carl Spatz, commandant at Selfridge Field, Major Powell, of the Marine Corps, Colonel Hanna, commandant at Fort Wayne, William B. Stout, builder of all-metal planes, Ralph Upson, balloon pilot and chief engineer of the Aircraft Development Corp., and Colonels Hutton and O'Dell, civilian directors of industrial mobilization, in the Detroit district.

Admiral Fullam, representing F. B. Patterson, president of the N.A.A., expressed the belief that the public's interest in air transportation is being awakened.

"Airplanes now form the force which dominates the world," he said. "If we fail to use the air in our commercial life we cannot give to our fighting forces on land and sea the support without which no nation can be successful in the next great war. Europe is devoting $10,000,000 annually to subsidize its commercial air lines, because these craft of commerce and their pilots will be instantly available in times of war. In this country, without government subsidy, it is up to the business brains of the nation to create such air lines for the commerce of the air is here to stay and develop."

Expressing his keen disappointment in the action of Congress in upsetting the carefully laid plans of the Navy Department for a trip of exploration to the North Pole by the airship Shenandoah, former Secretary Denby declared that the trip would have been of inestimable value to the country in a scientific way.

"If there is 1,000,000 sq. mi. of unexplored land within the polar basin it should be under the flag of the United States," he said. "There it lies, a constant challenge to America! A great tract of unexplored region, the last unconquered frontier. I still hope America will plant her flag there first. We do not know how much land there is there, but if there is any worth having we should own it by right of discovery. Here is a wonderful field to be conquered by the forces of the air."

Colonel Henderson told of the progress of the Air Mail Service which will make it possible for a letter mailed in New York to be delivered in San Francisco within 30 hr. He expressed the belief that the possibilities of commercial aviation in this country have only been scratched.

Mr Lehmann, who transferred his activities from the Zeppelin organization in Germany to the Goodyear-Zeppelin Company, declares that America offers, because of its size, an ideal field for the development of airship lines.

The Detroit Aviation Society re-elected all the officers as follows: Harold H Emmons, president, Jesse G Vincent, vice-president, Charles T Bush, treasurer, and Carl B Fritsche, secretary. William B. Mayo was chosen a director succeeding Henry B. Joy.

The society, in presenting resolutions, endorsed the establishment of a federal bureau of aviation.

Walter H Beach and L. C Stearman checking their course before flying the two new Swallows of the 1924 model from Wichita, Kan, to Dayton, Ohio

Swallows Delivered to Johnson Co.

The Swallow Airplane Mfg Co at Wichita, Kan recently delivered two Swallow airplanes to the Johnson Airplane and Supply Co of Dayton, Ohio. Walter H. Beach, general manager of the Johnson Company, and L. C. Stearman, engineer at the firm, flew the two ships from Wichita to Dayton at an average speed of 83.5 mi/hr. In the accompanying photograph the two pilots may be seen checking the route for their trip, which came off without the slightest incident.

The need for an efficient commercial airplane with the lowest possible maintenance cost is daily becoming more evident in the Middle West, where distances are great, railroad facilities are generally poor and the whole country is a continuous landing field. The 1924 Swallow, which was especially designed to fill this demand, is meeting it to the satisfaction of all who are using it. The remarkable speed range of this machine—35 to 95 mi/hr—together with its excellent carrying capacity of 700 lb and a 4 hr endurance at full throttle with a Curtiss OX5 engine, make of it an ideal three seater commercial plane.

Among the numerous users of the Swallow is the Garvers' Flying Circus, who recently purchased two ships of this model after having successfully used three Swallows of an older type.

Change of Name

In view of the international character of aviation, those of our readers who should want to write to Petrograd (St Petersburg), Russia, are informed that under a ruling of the Russian Soviet postal authorities all mail matter intended for Petrograd must after May 1 be addressed to *Leningrad* or it will be refused delivery by Government order.

Announcement that the former Russian imperial capital had been renamed in memory of the Bolshevik leader was made after the death of Lenin early this year.

Our Gordon Bennett Teams

The following teams will represent the National Aeronautic Association and the United States in the Gordon Bennett Balloon Race, to be held in Brussels, Belgium, June 15.

1. W. T. Van Orman, pilot, C. K. Wollam, aide and alternate.
2. H. E. Honeywell, pilot, C. W. Timmons, aide and alternate.
3. Maj. Norman W. Peck, A.S., pilot, Lieut. Wm. A. Gray, aide and alternate.

Kansas City News

By T S Jewett, jr

Easter Sunday saw the ushering in of what we think is going to be a successful flying season for Kansas City Airport and for those interested in aviation and its development in and around our City For the Military attached and assigned to Richards' Field, both of the regulars and the reserves, there was a total of 201 hr 10 min, aircraft hours Of this time, Air Service Reserve Officers flew 96 hr 35 min, Regular officers assigned, 16 hr 50 min, Regular Army officers, attending General Service Schools at Ft Leavenworth, 7 hr. 30 min; and observers 77 hr 20 min, making the total air hours of 123 hr 50 min.

There were thirty-seven Military ships in the Field for last month from the following places: Scott Field, Bradford, Ill., McCook, Brooks, Kelly, Ft Riley, Bowling Field, Fort Benjamin Harrison and Muskogee.

Regular Army officers and reserve officers here of the Air Service are looking forward to the arrival of the 16th Squadron under command of Major Tinker of Fort Riley, Kan, who will arrive the first part of next month to begin the establishment of the Camp for the Air Service Schools for Reserve Officers at this corps area. This will, of course, increase the military activities at the Field and make something of a military nature going on in the Field practically continually

There are now eleven commercial ships operating from the Field, with the expectation that two or three more will be in here within the next two or three weeks to use the Field for their base for this coming year

Cross country work by the civilian pilots has been very good the last month, Tex LaGrone making a total of twelve cross country hops to nearby fields, carrying both passengers and freight, B M Tuxhorn making a total of 8 cross country flights, Miller, one, and Ben Gregory, one

Tuxhorn has his new TB5 which was built by himself and is certainly remarkably good performance

Sam Fitzgerald is now the owner of an LF5, of which Spencer is doing the piloting for him

H G Long has sold his JN4D to Layton, who will operate it the balance of the summer

The famous "Honyuzeen" is back on the Field with a new Ford motor with overhead valves and evidently will be the center of the admiring groups as she was last summer

Visiting ships to the Field for April and up to date have been nine, reporting all the way from Mobile, Ala to the close surrounding fields

The Sunday crowds have been very good and passenger rides have been keeping the pilots pretty busy, and if the past nice days are any criterion, it is going to be a good summer for them

The new log restaurant, which is under the management of Mr Bush, will shortly be inaugurated This restaurant is of permanent construction and will accommodate about 75 people Will also carry in addition numerous sundries for visitors at the Field and will be open from early morning until late at night

Houston News

Activity in and about Houston, Tex., is increasing daily with the arrival of fine weather The Curtiss Aeroplane and Motor Co is disposing of their large lot of war surplus Standard J1 airplanes that have been stored here since taken over from the Air Service in 1919 While these planes have been stored in the open the past four or five years, and the fuselages require complete rebuilding before being put into service, the surfaces and the landing gears are in serviceable condition and make the planes an attractive buy. About 700 of these planes are available

Wm B Robertson, of the Robertson Aircraft Corp of St Louis is here in connection with the receipt and acceptance of forty Standards from the Curtiss Co, and en route to Havana, Cuba on his honeymoon.

J W McDermott, a local dealer, has completed construction and has delivered to purchaser E J Baker, a two seater converted Thomas-Morse Scout, powered with the Curtiss OX5 engine This job was test-flown the past week by Pilot F H Rust, and pronounced highly satisfactory. McDermott's crew is now engaged in rebuilding and reconditioning a Standard J1 for Pilot Thompson, formerly of the Gates aggregation. A Model "T" Navy Wright engine is being installed which was obtained from the Philadelphia Navy Yard by Tips & Smith, and 90 gal. fuel capacity is being provided.

Howard C Wilcox, original OX5 Standard dealer here, has largely increased his shop force, now having about twelve men employed Mr Wilcox has taken over a large lot of the Curtiss Standards and is rebuilding and converting them for the OX5 engine. Mr Wilcox's force recently completed converting twelve Standards and installing Model "A" Hisso engines for the S A Airways, Inc, six of which also went to the Mexican government and six of which were used in Florida the past week along with Cuban pilots

C C Cannon who operates a fleet of five Standards in connection with his oil field development and activities, has been forced to vacate his present field due to encroaching civilization. A new field and hangar site are now being arranged for Meanwhile several pilots and mechanics are idle.

W C Branum, local realty dealer and pilot, who operates Rice Field held open house Sunday at the Field and was honored by the visit of a squadron of five Curtiss H's from Ellington Field, the home of the 111th Observation Squadron 36th Division, National Guard of Texas Air Service Maj B A Law, commanding About ten private and commercial planes of local pilots also took the opportunity of entertaining the many visitors

Lloyd A Winship of the S. A Airways, Inc, San Antonio, Tex, is in the city in connection with the delivery of a large lot of the Curtiss Standards. With Mr Winship in the S A Airways are associated E C Hammond and the justly famed "Bilt" Long, longhorn pilot and former District Governor of the N A A

Ed J Bond, sportsman, pilot and merchant is now engaged in assembling his third plane This is a Standard that is being converted for the installation of a Salmson engine In addition he has in operation an OX Standard and a Thomas-Morse Scout with an OX5 that he uses in cross-country flying and on his duck hunting expeditions

Extension of Royal Dutch Air Service

The Royal Dutch Air Service Company has extended its air service between London, Rotterdam, and Amsterdam, to Copenhagen, which now makes possible a journey from London to Stockholm and Christiania in approximately from 37 to 40 hr, according to a recent report from London

Under the present schedule an airplane leaves Rotterdam daily (except Sunday) at 9 a m arriving at Bremen at 11 30 a m, Hamburg at 12 50 p m, and Copenhagen at 3 30 p m. From Copenhagen there is an excellent night train service to and from Stockholm and Christiania The return journey from Copenhagen is made by an airplane which leaves that city at 9 15 a m, arriving at Rotterdam at 5 05 p m From Rotterdam passengers are able to make the connection with the Batavier Line steamers at 7 p m arriving at Gravesend about 8 a m the next day and at London about 10 a m.

Passengers wishing to make the outward journey may travel by the Batavier Line, the boat train leaving London (Victoria Station) at 5 45 p m and arriving at Rotterdam about 8 o'clock the next morning, or by the Harwich route leaving Liverpool Street at 8 30 p m via The Hook of Holland to Rotterdam

The fare from London to Rotterdam is £4, from Rotterdam or Amsterdam to Hamburg £4, and from Hamburg to Copenhagen £6 5.

Passengers are allowed 30 lb of luggage free Excess luggage from Rotterdam or Amsterdam to Hamburg is charged 6d per lb, and from Hamburg or Amsterdam to Copenhagen 10d per lb

All fare includes free motor car conveyance for passengers and their luggage between the centers of the towns and the airdromes, and vice versa

Goods tariff is as follows: London to Rotterdam & Amsterdam, 5d per lb, min 3/6, London to Hamburg, 1/3d per lb min. 4/7, London to Copenhagen 1/8d. per lb min 5/-

Reduced rates may be obtained for consignments over 100 lb in weight

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Army Orders

First Lieut. James G Taylor, A S, leave extended 11 days.

First Lieut Raymond S Jett, A S, retired by Army retiring board, account disability incident to active service

Second Lieut. Thomas Rives Potts, A S, resignation accepted, effective April 19

First Lieut Dudley Ely Rowland, A.S, resignation accepted

Second Lieut George William Hartnell, A S, Brooks Field, to F A See Div, effective April 4, to rank from June 12, 1923

Two months' leave to Maj Leslie MacDill, A S, from June 1

Second Lieut John Delaney Sureau, A S., Brooks Field, to (A C) Fort Hancock, N J, reporting C.O, Sandy Hook Defenses for duty

One month's leave to Capt Edgar P Sorensen, A S, from Aug 1

Two months' sick leave to First Lieut Frank O Hunter, A S

Appointment as sec lieut, A S, R A, ranking from Feb 16 1924, of Daniel Allen Terry, announced, with assignment to A S Primary Flying School, Brooks Field

Transfer Capt Robert Chapin Caudee, Cav, Kelly Field, to A S effective March 7, ranking from Jan. 11, 1919, announced to remain on present duties.

Maj Lee Wilbert Wiggins, M O.R.C, Atlanta, to active duty School of Aviation Medicine, Mitchel Field, for course of instruction, effective May 12, to rank from April 12, and is relieved to reach his home by June 23

Maj Henry C Pratt, A S., to Chief, Air Service, on completion present course of instruction at Army War College, Washington Barracks, D C

First Lieut. Edmund P Gaines, A S, Pope Field, to Fairfield A I D after present leave

First Lieuts. Isaiah Davies and John M Davies, A S, Tactical School, Langley Field, to duty that station on completion present course

One month's leave to First Lieut Walter E Richards, A S., after present training course

"Turn Dolly" Constructed at Kelly Field

A "turn dolly" for the purpose of turning the airplanes on the line preparatory to take-off has been designed and constructed by members of the Engineering Department at Kelly Field, Tex, and has proven a success. The dolly is so constructed that two men can easily lift the tail of a DH4B airplane and turn it around. Two small airplane wheels serve as the fulcrum of the lever, which is a piece of lumber 4 in x 4 in x 12 ft The wheels are joined together with a short axle, the lever being fastened on the axle, with the short end extending out just far enough to catch under the rear end of the fuselage, and gives plenty of leverage to raise the plane's tail off the ground and swing it around The dolly not only eliminates a great deal of labor and time but decreases the chances of damage to the fuselage by allowing the men to lift the tail of the plane around as they formerly did A second one of these dollies is being constructed which will greatly increase the efficiency of the line force at the field.

Night Flying to be Increased

An order which holds great significance as to the strides made in night flying was received by the Engineering Division, McCook Field, Dayton, Ohio, directing that two JN6H, twelve MB3A, eighty DH4B, sixty-five NBS1 airplanes be equipped for this purpose. All equipment is obligated at the Fairfield Air Intermediate Depot or is on order and will be shipped to the various stations where changes will be made Instructions for equipping the planes for night flying are being prepared by the Engineering Division for distribution

U. S. NAVAL AVIATION

Mooring Mast Erected on U.S.S. Patoka

The airship mooring mast was placed on board the U S S Patoka now undergoing conversion as an airship tender at the Norfolk Navy Yard on May 5 This mast was fabricated at the Naval Aircraft Factory at Philadelphia The Patoka will be the first airship tender of any Navy ever to be commissioned

The original reason for the conversion of a fuel oil tanker into an airship tender was for use in connection with the operations of the Shenandoah during the proposed Naval Arctic Expedition With the suspension of plans for this expedition, it was decided to go ahead with the conversion of the Patoka with the view of using her as an airship tender for the operations of the Shenandoah with the Fleet The conversion of the Patoka will be completed during the early part of the summer

Plane Photographs a Flood

Aerial views of the flooded Potomac River were made by a plane from the Marine Flying Field at Quantico, Va. on May 14 Copies were printed at Quantico and delivered by plane to the Naval Air Station at Anacostia for distribution to the press on the same day.

Sec Lieut H B Bowden, U.S.M.C, was the pilot of the plane from which the pictures were taken and delivered Due to the flooded condition of the flying field at Anacostia the plane delivering the photographs was unable to land, but dropped them on a dry corner of the field

CALENDAR OF AERONAUTICAL EVENTS

March 25.	Start of the British World Flight, Southampton, England.
April 6.	Start of World Flight of the U S Army Air Service, Seattle.
June 3-11.	International Aircraft Exposition, Prague, Czechoslovakia.
June 15.	Gordon Bennett International Balloon Race, Brussels, Belgium
June 21.	Annual F.A.I. Conference, Paris, France.
June 22.	Commodore Beaumont International Cup Race for high speed airplanes, Istres, France.
July 5-6.	Zenith International Airplane Efficiency Race, Paris, France.
August.	"Tour de France des Avionnettes." International Round-France race for light airplanes.
Oct. 2-4.	International Air Races, incl. Pulitzer Trophy Race, Dayton, Ohio
Oct. 24-25.	Schneider Cup Race, Baltimore
Dec. 17.	Twenty-first anniversary of the first successful airplane flight.

Seaplane Landed on Landplane Field while Anacostia Station is Flooded

An HS2L seaplane was landed on the landplane field at the Naval Air Station at Anacostia on May 13 by Lieut. A J Williams, U.S N. The station and field were completely inundated by flood from the Potomac and Anacostia Rivers when heavy rains caused the swollen streams to leave their banks. The flood reached its highest point during the night of May 13. The landplane field was under water to a depth of 18 in in some parts, and Lieutenant Williams was able to land on it with the seaplane, in which he took off in the river in front of the station. The water forced the men to vacate their quarters and reached a height of from two to three feet in the hangars and other buildings. The landplane hangar was least affected by the flood and little permanent damage to material on the station was done.

Anacostia Planes Carry Congressmen

Transportation by air from Washington to the Naval Academy for two members of Congress, the Hon Clark Burdick and the Hon A McGee, was afforded by two planes from the Naval Air Station at Anacostia on May 10. The two Congressmen are members of the Annual Board of Visitors to the Naval Academy. Lieut. A. J Williams and Lieut David Rittenhouse piloted the two planes.

Aviation Riggers' School Inactive

The Bureau of Navigation advises that the Aviation Riggers' School at Great Lakes, Ill., will be kept closed during the fiscal year of 1924-25. The Aviation Carpenters School, the Aviation Machinists' School and the Aviation Metalsmiths' School at Great Lakes will, however continue to be operated.

PUBLISHER'S NEWS LETTER

At this time, when so much has to be written which at first thought may seem critical but in time will appear constructive, it is pleasing to extend good wishes to the newly formed Commercial Aircraft Association, the first unit of which was organized in Akron on Friday, May 23. The purpose of this organization is frankly stated to be, "To promote the financial welfare of individuals interested in commercial aeronautics." That is all. There is no buncombe of high sounding phrases behind which commercial advantages can be gained. It is just a local group of aviators, aircraft owners, owners of fields, manufacturers of aircraft and aircraft equipment, and promoters of aviation who wish to have a trade organization that will look after their joint interests locally.

* * * *

The pilots and field operators have been singularly out of the picture in the past when such organizations have been started. The old Aero Club was mainly under the control of "arm chair pilots" or others whose main interest seemed to be publicity rather than flying. When the N.A.A was formed, pilots in general were shown to a back seat, and as for the commercial pilot, well, he was parked in "Hell's Half Acre" when he arrived as an invited guest at the St. Louis races. The Aeronautical Chamber of Commerce is the representative of the industry and as such has done what it could to encourage commercial flying, but not by any stretch of the imagination could it be considered as speaking for the pilots. Therefore, the newly organized Commercial Aircraft Association, that will represent the pilot, the field owner and the smaller local operator, can fill a place that is not now occupied by any existing group.

* * * *

The idea of those who formed the C.A A of Akron is that any commercial aero organization, in order to succeed, must confine itself primarily to local problems. Then, as similar associations are formed elsewhere, they can federate and through a nationally organized body place the claims and opinions of the commercial operators before the public. Already plans are being made to hold a convention of all commercial operators of aircraft in Akron just before the races in Dayton in October. At this meeting it is proposed to form a federation which will include all the Commercial Aircraft Associations then formed. That the new C.A A can be extremely useful will be evident to anyone who has seen the place that the pilot has been forced to occupy in American aviation. He has been worked for publicity by everyone, but, through lack of authoritative and sympathetic channels, he has never been able to express his views or opinions.

AVIATION will be glad to follow the progress of the new organization with sympathetic encouragement. Having very close and constant contact with pilots, a few words of caution would appear helpful at this time. In order to achieve any great purpose, the will and opinion of the few must be melded into the general belief of the majority. The aphorism "All for One and One for All" might well serve as a fitting motto for the C A.A.

—L.D G.

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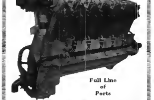

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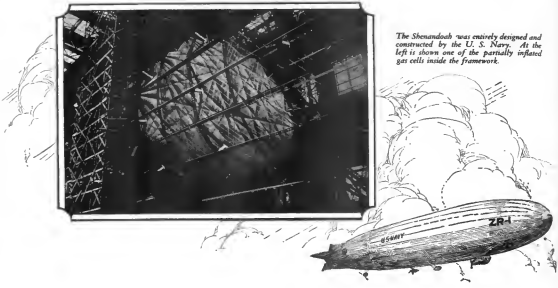

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